AMENDMENT TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of claims

1. (Currently Amended) A method for the preparation of a modified carrier for a catalyst to be used for the vapor phase epoxidation of alkene, comprising:

a) impregnating a preformed alpha-alumina carrier, which has been subjected to calcining and, optionally, other preforming treatments, as part of the preforming process, with at least one alkali metal hydroxide modifier;

b) optionally drying said impregnated carrier;

c) calcining said impregnated and optionally dried carrier; and

d) washing said calcined carrier.

2. (Currently Amended) A method for the preparation of a catalyst to be used for the vapor phase epoxidation of alkene, comprising:

a) impregnating a preformed alpha-alumina carrier, which has been subjected to calcining and, optionally, other preforming treatments, as part of the preforming process, with at least one alkali metal hydroxide modifier;

b) optionally drying said impregnated carrier;

c) calcining said impregnated and optionally dried carrier;

d) washing said calcined carrier; and

e) depositing silver catalytic material on said calcined carrier

3. (Original) The method of claim 1 or 2 wherein said calcining is carried out at a temperature of 800°C. to 1800°C.

4. (Original) The method of claim 1 or 2 wherein said alpha-alumina carrier has a morphology comprising interlocking platelets.

5. (Original) The method of claim 1 or 2 wherein said alpha-alumina carrier is prepared by contacting boehmite alumina and/or gamma-alumina with an acidic mixture containing halide anions and water.

6. (Original) The method of claim 1 or 2 wherein at least one efficiency enhancing promoter is deposited on said preformed alpha-alumina carrier.

7. (Original) The method of claim 6 wherein said promoter comprises a rhenium-containing compound.

8. (Original) The method of claim 7 wherein said alkene is ethylene.

9. (Original) The method of claim 1 or 2 wherein said alkali metal hydroxide is present in an amount from 0.01 to 5.0 weight percent, based on the total weight of the modified alumina carrier.

10. (Original) The method of claim 1 or 2 wherein said alkali metal hydroxide is sodium hydroxide.

11. (Currently Amended) A modified carrier for a catalyst to be used for the vapor phase epoxidation of alkene prepared by a method comprising:

a) impregnating a preformed alpha-alumina carrier, which has been subjected to calcining and, optionally, other preforming treatments, as part of the preforming process, with at least one alkali metal hydroxide modifier;

b) optionally drying said impregnated carrier;

c) calcining said impregnated and optionally dried carrier; and

d) washing said calcined carrier.

12. (Currently Amended) The modified carrier of claim 11 wherein said alpha-alumina carrier has a morphology comprising interlocking platelets.

13. (Currently Amended) A novel catalyst to be used for the vapor phase epoxidation of alkene prepared by a method comprising:

a) impregnating a preformed alpha-alumina carrier, which has been subjected to calcining and, optionally, other preforming treatments, as part of the preforming process, with at least one alkali metal hydroxide modifier;

b) optionally drying said impregnated carrier;

c) calcining said impregnated and optionally dried carrier;

d) washing said calcined carrier; and

e) depositing silver catalytic material on said dried carrier.

14. (Original) The catalyst of claim 13 wherein said alpha-alumina carrier has a morphology comprising interlocking platelets.

15. (Currently Amended) The catalyst of claim 13 wherein said alkali metal hydroxide is sodium hydroxide.

16. (New) A process for the epoxidation of an olefin comprising the steps of: contacting a feed comprising an olefin and oxygen with a catalyst comprising a silver component deposited on a fluoride-mineralized carrier; and producing a product mix comprising an olefin oxide, wherein the partial pressure of olefin oxide in the product mix is greater than about 60 kPa.

17. (New) A process as claimed in claim 16, wherein the catalyst additionally comprises a high-selectivity dopant.

18. (New) A process as claimed in claim 17, wherein the high-selectivity dopant comprises a rhenium component.

19. (New) A process as claimed in claim 16, wherein the catalyst additionally comprises Group IA metal component.

20. (New) A process as claimed in claim 16, wherein the carrier comprises alpha-alumina.

21. (New) A process as claimed in claim 16, wherein the olefin comprises ethylene.

22. (New) A process for the epoxidation of an olefin comprising the steps of: contacting a feed comprising an olefin and oxygen with a catalyst comprising a silver component and a high-selectivity dopant deposited on a fluoride-mineralized carrier; and producing a product mix comprising an olefin oxide, wherein the partial pressure of olefin oxide in the product mix is greater than about 20 kPa.

23. (New) A process as claimed in claim 22, wherein the high-selectivity dopant comprises a rhenium component.

24. (New) A process as claimed in claim 23, wherein the catalyst additionally comprises a rhenium co-promoter.

25. (New) A process as claimed in claim 22, wherein the catalyst additionally comprises a Group IA metal component.

26. (New) A process as claimed in claim 22, wherein the process employs a fixed bed, tubular reactor.

27. (New) A process as claimed in claim 22, wherein the partial pressure of olefin oxide is greater than about 30 kPa.

28. (New) A process as claimed in claim 22, wherein the partial pressure of olefin oxide is from about 40 kPa to about 60 kPa.

29. (New) A process as claimed in claim 22, wherein the carrier comprises alpha-alumina.

30. (New) A process as claimed in claim 22, wherein the olefin comprises ethylene.

31. (New) A process for the epoxidation of an olefin comprising the steps of: contacting a feed comprising an olefin and oxygen with a catalyst comprising a

silver component deposited on a carrier having a particulate matrix having a lamellar or platelet-type morphology; and producing a product mix comprising an olefin oxide, wherein the partial pressure of olefin oxide in the product mix is greater than about 60 kPa.

32. (New) A process as claimed in claim 31, wherein the lamellar or platelet-type morphology is such that particles having in at least one direction a size greater than 0.1 micrometer have at least one substantially flat major surface.

33. (New) A process for the epoxidation of an olefin comprising the steps of: contacting a feed comprising an olefin and oxygen with a catalyst comprising a silver component and a high-selectivity dopant deposited on a carrier having a particulate matrix having a lamellar or platelet-type morphology; and producing a product mix comprising an olefin oxide, wherein the partial pressure of olefin oxide in the product mix is greater than about 20 kPa.

34. (New) A process as claimed in claim 33, wherein the high selectivity dopant comprises a rhenium component and the catalyst additionally comprises a rhenium co-promoter.

35. (New) A process as claimed in claim 33, wherein the lamellar or platelet-type morphology is such that particles having in at least one direction a size greater than 0.1 micrometer have at least one substantially flat major surface.

36. (New) A process for the production of a 1,2-diol, a 1,2-diol ether or an alkanolamine comprising converting an olefin oxide into the 1,2-diol, the 1,2-diol ether or the alkanolamine wherein the olefin oxide has been obtained by a process for the epoxidation of an olefin as claimed in claim 16.

37. (New) A process for the epoxidation of an olefin comprising the steps of: contacting a feed comprising an olefin and oxygen with a catalyst comprising a

silver component deposited on an alpha-alumina carrier; and producing a product mix comprising an olefin oxide, wherein the partial pressure of olefin oxide in the product mix is from about 19 to 32 kPa, and wherein said alpha-alumina is prepared by a process comprising the step of contacting an alpha-alumina precursor with fluoride anions.

38. (New) A process as claimed in claim 37, wherein said alpha-alumina is prepared by contacting an alpha-alumina precursor with fluoride anions followed by calcining the fluoride-contacted alpha-alumina precursor under conditions sufficient to form platelets of alpha-alumina.

39. (New) A process as claimed in claim 37, wherein the catalyst additionally comprises a promoter selected from the group consisting of compounds of rhenium, molybdenum, tungsten, and an efficiency-enhancing salt of a member of a redox half-reaction pair comprising nitrate, nitrite, or other anions capable of forming nitrate anions under epoxidation conditions in the presence of a nitrogen-containing gaseous efficiency-enhancing member of a redox half-reaction pair.

40. (New) A process as claimed in claim 39, wherein the promoter comprises a rhenium component.

41. (New) A process as claimed in claim 37, wherein the catalyst additionally comprises a Group IA metal cation.

42. (New) A process as claimed in claim 37, wherein said alpha-alumina carrier is prepared by a method comprising the steps of:

(a) selecting an alumina selected from the group consisting of boehmite alumina (AlOOH), gamma-alumina and mixtures thereof;

(b) peptizing the alumina of step (a) with a mixture containing an acidic component and fluoride anions to provide peptized fluorinated alumina;

(c) forming the peptized fluorinated alumina of step (b) to provide formed peptized fluorinated alumina;

(d) drying the formed peptized fluorinated alumina of step (c) to provide dried formed alumina;

(e) calcining the dried formed alumina of step (d) to form a preformed alpha-alumina carrier;

(f) impregnating the preformed alpha-alumina carrier of step (e) with at least one alkali metal hydroxide modifier to form an impregnated carrier;

(g) optionally drying the impregnated carrier of step (f) to form a dried carrier;

(h) calcining the impregnated carrier of step (f) or the optionally dried carrier of step (g) to form a calcined carrier; and

(i) washing the calcined carrier of step (h).

43. (New) A process as claimed in claim 37, wherein the olefin comprises ethylene.

44. (New) A process as claimed in claim 40, wherein the catalyst additionally comprises a rhenium co-promoter.

45. (New) A process as claimed in claim 39, wherein the process employs a fixed bed, tubular reactor.

46. (New) A process for the epoxidation of an olefin comprising the steps of: contacting a feed comprising an olefin and oxygen with a catalyst comprising a

silver component deposited on an alpha-alumina carrier comprising particles each of which has at least one substantially major surface having a lamellate or platelet morphology; and producing a product mix comprising an olefin oxide, wherein the partial pressure of olefin oxide in the product mix is from about 19 to 32 kPa.

47. (New) A process as claimed in claim 46, wherein said alpha-alumina is prepared by contacting an alpha-alumina precursor with fluoride anions followed by calcining the fluoride-contacted alpha-alumina precursor under conditions sufficient to form platelets of alpha-alumina.

48. (New) A process as claimed in claim 46, wherein said alpha-alumina carrier is prepared by a method comprising the steps of:

(a) selecting an alumina selected from the group consisting of boehmite alumina (AlOOH), gamma-alumina and mixtures thereof;

(b) peptizing the alumina of step (a) with a mixture containing an acidic component and fluoride anions to provide peptized fluorinated alumina;

(c) forming the peptized fluorinated alumina of step (b) to provide formed peptized fluorinated alumina;

(d) drying the formed peptized fluorinated alumina of step (c) to provide dried formed alumina;

(e) calcining the dried formed alumina of step (d) to form a preformed alpha-alumina carrier;

(f) impregnating the preformed alpha-alumina carrier of step (e) with at least one alkali metal hydroxide modifier to form an impregnated carrier;

(g) optionally drying the impregnated carrier of step (f) to form a dried carrier;

(h) calcining the impregnated carrier of step (f) or the optionally dried carrier of step (g) to form a calcined carrier; and

(i) washing the calcined carrier of step (h).

49. (New) A process for the epoxidation of an olefin comprising the steps of: contacting a feed comprising an olefin and oxygen with a catalyst comprising a silver component and a promoter selected from the group consisting of compounds of rhenium, molybdenum, tungsten, and an efficiency-enhancing salt of a member of a redox half-reaction pair comprising nitrate, nitrite, or other anions capable of forming nitrate anions under epoxidation conditions in the presence of a nitrogen-containing gaseous efficiency-enhancing member of a redox half-reaction pair deposited on an alpha-alumina carrier comprising particles each of which has at least one substantially major surface having a lamellate or platelet morphology; and producing a product mix comprising an olefin oxide, wherein the partial pressure of olefin oxide in the product mix is in from about 19 to 32 kPa.

50. (New) A process as claimed in claim 49, wherein said alpha-alumina is prepared by contacting an alpha-alumina precursor with fluoride anions followed by calcining the fluoride-contacted alpha-alumina precursor under conditions sufficient to form platelets of alpha-alumina.

51. (New) A process as claimed in claim 49, wherein said alpha-alumina carrier is prepared by a method comprising the steps of:

(a) selecting an alumina selected from the group consisting of boehmite alumina (AlOOH), gamma-alumina and mixtures thereof;

(b) peptizing the alumina of step (a) with a mixture containing an acidic component and fluoride anions to provide peptized fluorinated alumina;

(c) forming the peptized fluorinated alumina of step (b) to provide formed peptized fluorinated alumina;

(d) drying the formed peptized fluorinated alumina of step (c) to provide dried formed alumina;

(e) calcining the dried formed alumina of step (d) to form a preformed alpha-alumina carrier;

(f) impregnating the preformed alpha-alumina carrier of step (e) with at least one alkali metal hydroxide modifier to form an impregnated carrier;

(g) optionally drying the impregnated carrier of step (f) to form a dried carrier;

(h) calcining the impregnated carrier of step (f) or the optionally dried carrier of step (g) to form a calcined carrier; and

(i) washing the calcined carrier of step (h).

52. (New) A process as claimed in claim 49, wherein the promoter comprises a rhenium component and the catalyst additionally comprises a rhenium co-promoter.